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Albuquerque Bernalillo County
Water Utility Authority

WATER RECLAMATION DIVISION
4201 2ND STREET SW, ALBUQUERQUE, NEW MEXICO 87105

WATER QUALITY LABORATORY
STANDARD OPERATING PROCEDURE APPROVAL FORM

WQL QA SOP 007
General Terms and Definitions

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History of Revision This table lists the revision history and effective dates of this procedure.

Revision	Date	Description of Changes
01	May 21, 2008	New QA SOP to define all general terms used at WQL

1.0 Scope and Application

1.1. This Standard Operating Procedure (SOP) will follow the requirements of ISO Standard 17025.

1.2. This SOP will apply to all standard operating procedures within WQL, and represents the general terms related to quality and technical procedures.

1.3. When appropriate, WQL SOP's will reference this QA SOP for the use of general terms related to quality and technical procedures. Where additional or different definitions are required for specific standard operating procedures those will be defined in the individual SOP's.

2.0 Terms

2.1 AA: Atomic Absorption

2.2 Absorption: A process by which one substance is taken up by another, either chemically or physically, and held in pores in the interior. Transformation into other forms suffered by radiant energy passing through a material substance.

2.3 Accuracy: Combination of bias and precision of an analytical procedure, which reflects the closeness of a measured value to a true value.

2.4 ACS: American Chemical Society

2.5 Adsorption: Adherence of molecules, atoms and ions of gas or liquid to the surface of another substance as the result of a variety of weak attractions that involve ionic, Van der Waals, and surface active forces.

2.6 Aliquot: A measured portion of a sample taken for analysis.

2.7 Alkalinity: The capacity of bases to neutralize acids.

2.8 AMU: Atomic Mass Units

2.9 Analytical Batch: Samples which are analyzed together with the same method sequence and the same lots of reagents and with the same manipulations common to each sample within the same time period. *A batch consists of 20 or fewer samples.*

2.10 APHA: American Public Health Association.

2.11 ASTM: American Society for Testing and Materials

2.12 AWWA: American Water Works association.

2.13 Baseline: The curve representing the scanning analysis of a blank, which has been processed as though it were a test sample and which was expected to be identical to test samples except that the unknown to be measured was intentionally omitted.

2.14 BOD: Biochemical Oxygen Demand

2.15 Buffer: A solution that is capable of opposing small changes in chemical composition; particularly in PH.

2.16 °C: Degree(s) Celsius.

2.17 Calibration: Comparison of a measurement standard or instrument with another standard or instrument to repost or eliminate, by adjustment, any variation or deviation in the accuracy of the item being compared.

2.18 Calibration Blank (Cal Blk): A volume of reagent water of the same matrix as in the calibration standards.

2.19 Chain of Custody- An unbroken trail of accountability that ensures the physical security of samples, data, and records.

2.20 cm, cm^2 cm^3: Centimeter(s), Square Centimeter(s), Cubic Centimeter(s).

2.21 COD: Chemical Oxygen Demand.

2.22 CONC: Concentrated.

2.23 Condition- A value assigned to an instance record to indicate the progress of that record through the lab. Together with a status value, condition monitors the progress of instance records. A condition is assigned by the SQL*LIMS software when a record is created during the logging process. Thereafter, the software automatically updates this value as the record passes certain milestones.

2.24 Control Charts: Charts used to maintain a current awareness of the accuracy/precision of each method and that the default acceptance criteria in the methods be updated to properly reflect the capability of the laboratory.

2.25 Contract Laboratory: An outside laboratory performing work for WQL providing analytical services under a contract with City of Albuquerque Water Authority Wastewater Division.

2.26 Corrective Action- Any measure taken to rectify conditions adverse to quality and, where possible, to prevent recurrence.

2.27 Correlation Coefficient (CC)- Is a number in the range -1 through +1 that measures how closely the calculated line fits the data. All calibration curves must have a calculated CC of greater than or equal to 0.995.

2.28 Deionized Water: Water treated to remove Chlorine, dissolved solids, and other potential interfering constituents. Type I deionized water has a resistivity at 25C of >10 megohm-cm. Type II deionized water has a resistivity at >1.0 megohm-cm.

2.29 Dissolved Analyte- The concentration of analyte in an aqueous sample that will pass through a 0.45 *u*m membrane filters.

2.30 Dissolved Solids: Solids that are in solution and can not be filtered from the solution as suspended solids can.

2.31 Diffusion: The spontaneous mixing of one substance with another when in contact or separated by a permeable or micro porous membrane.

2.32 Distillation: A purification process that takes advantage of changing the phase of a substance from liquid to vapor and back to liquid at the boiling temperature of the substance, in order to separate it from other substances with higher or lower boiling points.

2.33 DO: Dissolved Oxygen

2.34 Document - a written or printed paper that bears the original, official, or legal form of something and provides rules, guidelines or instructions for activities or their results.

2.35 Document Control – The policies and procedures used by an organization to ensure that its documents and their revisions are proposed, reviewed, approved for release, inventoried, distributed, archived, stored, and retrieved in accordance with the organization's specifications.

2.36 Effluent: The output or discharge from a water treatment process.

2.37 Feed water: Source water entering a treatment process.

2.38 Field Blank – A clean analyte-free sample which is carried to the sampling site and then exposed to sampling conditions, returned to the laboratory, and treated as an environmental sample. This blank is used to provide information about contaminants that may be introduced during sample collection, storage, and transport.

2.39 Field Duplicate (FD) – A field sample that is collected identically to the field sample and exposed to sampling site conditions, storage, preservation, and all analytical procedures. The purpose of the FD is to determine precision of the entire measurement process from field to analysis to reporting.

2.40 Field Reagent Blank (FRD) – an aliquot of reagent water or other blank matrix that is placed in a sample container in the laboratory and treated as a sample in all respects, including shipment to the sampling site, exposure to the sampling site conditions, storage, preservation, and all analytical procedures. The purpose of the FRB is to determine if method analytes or other interferences are present in the filed environment.

2.41 Filtration: A purification process in which a liquid is passed through a porous material to separate particles, impurities, etc.

2.42 g: Gram(s)

2.43 Grab Sample: A sample collected at a specific time and specific location, used to determine the nature of the sampled medium for that specific time and location only.

2.44 Holding Time – The period of time a sample may be stored before analysis. While exceeding the holding time does not necessarily negate the veracity of analytical results, it causes the qualifying or "flagging" of any data not meeting all of the specified acceptance criteria.

2.45 IC: Ion Chromatograph

2.46 ICP: Inductively Coupled Plasma

2.47 Instance – A record or set of records that is created based on template data. An instance record inherits data from a template and is an *instantiation* of the template.

2.48 Instrument Detection Limit (IDL) – The concentration equivalent to the analyte signal which is equal to three times the standard deviation of a series of replicate measurements of the calibration blank signal at the same wavelength.

2.49 Instrument Performance Check (IPC) – A specific test to evaluate the performance of the instrument.

2.50 Interference – An enhancement or depression of the analytical signal of an analyte in a sample when compared with an aqueous standard of the same concentration.

2.51 ISO- International Organization for Standardization

2.52 kg: Kilogram(s)

2.53 Liner Range: The concentration range over which the analytical curve remains linear. Determined in the initial method development and performance demonstration.

2.54 L: Liter(s)

2.55 *M*: Mole or Molar

2.56 m, m^2, m^3: Meter(s), Square Meter(s), Cubic Meter(s)

2.57 MCL: Maximum Contaminant Level.

2.58 MDL: Method Detection Limit.

2.59 Method: A definitive procedure for the identification, measurement, and evaluation of one or more qualities, characteristics, or properties of a material, product, system, or service that produces a test result.

2.60 mg: Milligram

2.61 Min: Minutes

2.62 mL: Milliter

2.63 mm, mm^2, mm^3: Millimeter, Square Millimeter, Cubic Millimeter

2.64 mol wt: Molecular Weight

2.65 MS: Mass Spectrometer

2.66 µg: Microgram

2.67 µL: Microliter

2.68 *N*: Normal

2.69 NIST: The National Institute of Standards and Technology is a federal technology agency that develop and promote measurement, standards and technology.

2.70 No.: Number

2.71 NTU's: Nephlometric Turbidity Unit: units used to measure Turbidity.

2.72 Peak Area: The area under a peak, designated as A-s

2.73 Peak Height: The highest absorbance signal of an absorbance peak profile.

2.74 Peak Profile: The absorbance vs. time signal.

2.75 Precision: A measure of the degree of agreement among replicate analyses of a single sample or duplicate usually expressed as the standard deviation or % difference.

2.76 Pretreatment: Initial: Water treatment steps performed to protect downstream elements from premature failure.

2.77 Protocol: A written sample management policy that clearly outlines the specific analysis and circumstances under which samples shall be accepted.

2.78 Proficiency Evaluation Samples (PE): EPA water studies and in house quality control using secondary reference materials provided by QA Manger. The purpose of PE sample is to evaluate the laboratory performance and analyst performance.

2.79 Quality: An encompassing term comprising utility, objectivity, and integrity.

2.80 Quality Assurance: A definite integrated system involving planning, implementation, assessment, reporting and quality improvement plan for laboratory operation that specifies the measures used to produce data of known precision.

2.81 Quality Control: Set of measures within a sample analysis methodology to assure that the process is in control.

2.82 Quality Manual: Specifics the quality management system of WQL.

2.83 Records: an account, as of information or facts, set down in writing as a means of preserving knowledge or data.

2.84 Reporting: A recording of test results and all ancillary information, dates, times, analyst name, measurements and calculations in the appropriate books.

2.85 Repeatability: The closeness of the agreement between the results of a sample of measurements of a given measure carried out using the same measurement procedure, using the same measuring tests equipment, under the same conditions for use and environment.

2.86 Replicate: Repeated operation occurring within an analytical procedure. Minimum of three data points for each method of analysis is required.

2.87 Resolution: A quantitative expression of the ability of an indicating device to distinguish meaningfully between closely adjacent values of the quantity

indicated.

2.88 SD: Standard Deviation

2.89 s: Seconds

2.90 Sample: Means a material collected and submitted to WQL for testing from a single location or point over a predetermined period. A sample may be submitted in one or many containers but represents one unique instance of a material type of interest.

2.91 Sample Custody: A sample is considered to be under a person's custody if it is in the individual's physical possession or secured in an area restricted to authorized personnel.

2.92 Sedimentation: Process by which water is allowed to stand long enough for solids to settle by gravity.

2.93 Solution: A homogeneous mixture of one or more substances (solutes) dispersed at the molecular level in a quantity of dissolving medium (solvent)

2.94 SQL-LIMS (Structured Query Language Laboratory Information Management System): Represents the laboratory sample management system utilized at WQL as provided by Applied Biosystems, Inc.

2.95 Standard: A material or reference that has been extensively defined and accepted as a primary standard, or has been suitably quantified against secondary or tertiary standards in such a manner that it is traceable to the primary standard.

2.96 Standard Operating Procedures (SOP): A document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps to be followed. It is officially approved as the method for performing certain routine or repetitive tasks.

2.97 Stock Standard Solution: A concentrated solution containing one or more method analytes from purchased standards from a commercial source.

2.98 Suspended Solids: Undissolved solids that can be removed by filtration.

2.99 TOC: Total Organic Carbon

3.00 Traceability: The ability to chronologically interrelate the uniquely identifiable entities in a way that matters, to verify the history, location or application of an item by means of recorded identification.

3.01 Uncertainty: The range of values within which the true value is estimated to lie. It is best estimate of possible inaccuracy due to both random and systematic errors.

3.02 Verification: The process of evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, or contractual specifications.